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Atty. Dkt. No. 080542-0157  
Appl. No. 10/081,208

**UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Applicants: Isao Mochida et al.

Title: Heat-Treated Active Carbons for Use in Denitration, Processes for  
Producing Same, Denitration Method Using Same, and Denitration  
System Using Same

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**AMENDED APPEAL BRIEF UNDER 37 CFR § 41.37**

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Sir:

This amended Appeal Brief responds to a Notification of Non-Compliant Appeal Brief mailed June 11, 2007. The only substantive change compared to the Appeal Brief filed April 18, 2007 is on page 3 in the Section "Status of Claims".

This is an appeal pursuant to 35 U.S.C. § 134 from the Examiner's decision rejecting claims 23-28 as set forth in the Office Action dated October 24, 2006. This Appeal Brief is being filed together with a credit card payment form in the amount of \$500.00 covering the 37 C.F.R. § 41.20(b)(2) appeal fee. If this fee is deemed to be insufficient, authorization is hereby given to charge any deficiency (or credit any balance) to the undersigned deposit account 19-0741.



**TABLE OF CONTENT**

<b>APPEAL BRIEF UNDER 37 CFR § 41.37 .....</b>	<b>I</b>
<b>I. REAL PARTY IN INTEREST .....</b>	<b>1</b>
<b>II. RELATED APPEALS AND INTERFERENCES .....</b>	<b>2</b>
<b>III. STATUS OF CLAIMS .....</b>	<b>3</b>
<b>IV. STATUS OF AMENDMENTS .....</b>	<b>4</b>
<b>V. SUMMARY OF CLAIMED SUBJECT MATTER.....</b>	<b>5</b>
<b>VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL .....</b>	<b>8</b>
<b>VII. ARGUMENT.....</b>	<b>9</b>
<b>A. Claims 23-28 Are Not Obvious Under 35 U.S.C. § 103(a) over Seki (US patent no. 3,961,020) taken with Oikawa (US patent no. 4,831,011) in view of Liang (US patent no. 5,462,908). ....</b>	<b>9</b>
<b>B. Claims 23-28 Are Not Obvious Under 35 U.S.C. § 103(a) Over Nishino (US patent no. 4,256,728) Taken With Oikawa (US patent no. 4,831,011) In View Of Liang (US patent no. 5,462,908).....</b>	<b>14</b>
<b>CONCLUSION .....</b>	<b>20</b>
<b>VIII. APPENDIX A: CLAIMS APPENDIX .....</b>	<b>21</b>
<b>IX. APPENDIX B: EVIDENCE APPENDIX .....</b>	<b>24</b>
<b>X. APPENDIX C. RELATED PROCEEDINGS APPENDIX.....</b>	<b>25</b>

**FEDERAL CASES**

<i>Graham v. John Deere Co.</i> , 383 U.S. 1 (1966).....	9
<i>In re Dembiczak</i> , 175 F.3d 994 .....	9
<i>In re Gartside</i> , 203 F.3d 1305 .....	9
<i>In re Lee</i> , 277 F.3d 1338, 1346 .....	9
<i>In re Oetiker</i> , 24 USPQ2d 1443 .....	9
<i>In re Royka</i> , 490 F.2d 981 .....	9
<i>In re Zurko</i> , 59 USPQ2d 1693 .....	9



Atty. Dkt. No. 080542-0157  
Appl. No. 10/081,208

## REAL PARTY IN INTEREST

The real party of interest is Osaka Gas Company Limited, which is the assignee of each inventor's entire interest as recorded at reel/frame nos. 8659/0582 in the parent application issued as U.S. patent no. 6,127,312.

**II. RELATED APPEALS AND INTERFERENCES**

No related appeals or interferences are pending.

### **III. STATUS OF CLAIMS**

Claims 1-28 were/are in the record.

Claims 1-10 and 13-20 are cancelled.

Claims 11-12 and 21-28 are currently pending.

Claims 23-28 are rejected and appealed.

Claims 11-12 and 21-22 are withdrawn.

**IV. STATUS OF AMENDMENTS**

Amendment filed January 23, 2007 was not entered.

## **V. SUMMARY OF CLAIMED SUBJECT MATTER**

In one embodiment, the claimed invention of claim 23 relates to a denitration system (page 26, lines 4-5) comprising (A) a first reactor (page 26, lines 6-7) that has an inlet and an outlet (Figure 2) and that is packed with a heat treated active carbon (page 26, lines 8-9) having an atomic surface oxygen/ surface carbon ratio of 0.05 or less (page 7, lines 12-13; pages 19-20, Table 2; page 26, line 26 through page 27, line 2); (B) a second reactor (page 26, line 7) that has an inlet and an outlet (Figure 2) and that is packed with said heat treated active carbon (page 26, lines 8-9), wherein the outlet of the first reactor is connected to the inlet of the second reactor (Figure 2); (C) an ammonia supply line that is connected the inlet of said first reactor (Figure 2); (D) a system inlet that is connected to the inlet of said first reactor (Figure 2); and (E) a system outlet that is connected to the outlet of the second reactor (Figure 2).

A separately patentable embodiment, which will be separately argued in this brief, is the embodiment of claim 24, which relates to the denitration system of claim 23, wherein the heat treated active carbon is a heat treated carbon fiber (page 26, line 26 through page 27, line 2).

Yet another separately patentable embodiment, which will be separately argued in this brief, is the embodiment of claim 25, which relates to a denitration system (page 28, line 25 through page 29 line 1) comprising (A) a first reactor (page 29, lines 2-3) that has an inlet and an outlet (Figures 3A and 3B) and that is packed with a heat treated active carbon (page 29, lines 6-8) having an atomic surface oxygen/ surface carbon ratio of 0.05 or less (page 7, lines 12-13; pages 19-20, Table 2); (B) a second reactor (page 29, line 3) that has an inlet and an outlet (Figures 3A and 3B) and that is packed with said heat treated active carbon (page 29, lines 7-8); (C) an ammonia supply line that is connected to the inlet of the first reactor through a first valve and to the inlet of the second reactor through a second valve (Figures 3A and 3B); (D) a system inlet that is connected to the inlet of the first reactor through the first valve and to the inlet of the second reactor through the second valve (Figures 3A and 3B); and (E) an outlet of the denitration system (Figures 3A and 3B),



wherein

(i) the outlet of the first reactor is connected to the inlet of the second reactor through the third valve and to the system outlet through the fourth valve (Figures 3A and 3B),

(ii) the outlet of the second reactor is connected to the system outlet through the fifth valve and the inlet of the first reactor through the sixth valve (Figures 3A and 3B), and

(iii) if the first, third and fifth valves are open, the second, fourth and sixth valves are closed (Figure 3A), and if the first, third and fifth valves are closed, the second, fourth and sixth valves are open (Figure 3B).

Still another separately patentable embodiment, which will be separately argued in this brief, is the embodiment of claim 26 which relates to the denitration system of claim 25, wherein the heat treated active carbon is a heat treated carbon fiber (page 9, lines 19-23).

Still another separately patentable embodiment, which will be separately argued in this brief, is the embodiment of claim 27 which relates to a denitration system (page 30, lines 22-23) comprising (A) a denitrator (page 31, line 1) that has an inlet and an outlet (Figures 4-6) and that is packed with a heat treated active carbon (page 31, lines 8-9) having an atomic surface oxygen/ surface carbon ratio of 0.05 or less (page 7, lines 12-13; pages 19-20, Table 2); (B) a first  $\text{NH}_3$  adsorber (page 30, lines 24-25) that has an inlet and an outlet (Figures 4-6); (C) a first  $\text{NH}_3$  adsorber (page 30, line 25) that has an inlet and an outlet (Figures 4-6); (D) a first ammonia supply line (Figures 4-6); (E) a second ammonia supply line (Figures 4-6); (F) a system inlet (Figures 4-6); and (G) a system outlet (Figures 4-6), wherein

(i) the system inlet is connected to the inlet of the first adsorber via a first valve and to the outlet of the second adsorber through the second valve (Figures 4-6);

(ii) the first ammonia supply line is connected to both the inlet of the denitrator and the outlet of the first adsorber through a third valve (Figures 4-6);

(iii) the second ammonia supply line is connected to both the outlet of the denitrator and the inlet of the second adsorber through a fourth valve (Figures 4-6);

(iv) the inlet of the denitrator is connected to the outlet of the first adsorber (Figures 4-6);

(v) the outlet of the denitrator is connected to the inlet of the second adsorber (Figures 4-6);

(vi) the outlet of the second adsorber is connected to the system outlet through a fifth valve (Figures 4-6);

(vii) the inlet of the first adsorber is connect to the system outlet through a sixth valve (Figures 4-6); and

(viii) if the first, third and fifth valves are open, the second, fourth and sixth valves are closed (Figures 4 and 6), and if the first, third and fifth valves are closed, the second, fourth and sixth valves are open (Figure 5).

Still another separately patentable embodiment, which will be separately argued in this brief, is the embodiment of claim 28 which relates to the denitration system of claim 27, wherein the heat-treated active carbon is a heat carbon fiber (page 9, lines 19-23).

**VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

The grounds of rejection for review are as follows:

A. The rejection of claims 23-28 under 35 U.S.C. § 103(a) as obvious over Seki (US patent no. 3,961,020) taken with Oikawa (US patent no. 4,831,011) in view of Liang (US patent no. 5,462,908);

B. The rejection of claims 23-28 under 35 U.S.C. § 103(a) as obvious over Nishino (US patent no. 4,256,728) taken with Oikawa (US patent no. 4,831,011) in view of Liang (US patent no. 5,462,908).

## VII. ARGUMENT

**A. Claims 23-28 Are Not Obvious Under 35 U.S.C. § 103(a) over Seki (US patent no. 3,961,020) taken with Oikawa (US patent no. 4,831,011) in view of Liang (US patent no. 5,462,908).**

1. Claims 23-28 Are Not Obvious Because The Cited References Fail to Teach Or Suggest A Heat Treated Carbon Having An Atomic Surface Oxygen/Surface Carbon Ration of 0.05 Or Less.

Claims 23-28 are patentable over Seki taken with Oikawa in view of Liang because Seki, Oikawa and Liang, taken alone or in combination, fail to teach or suggest a heat treated carbon having an atomic surface oxygen/ surface carbon ratio of 0.05 or less required by each of the claims 23-28.

A determination of obviousness under 35 U.S.C. § 103 is a legal conclusion based on underlying facts: (1) the scope and content of the prior art, (2) the differences between the prior art and the claimed invention at the time of the invention, (3) the level of ordinary skill in the art, (4) objective indices of nonobviousness. *See Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). A further inquiry is whether or not a person of ordinary skill in the art would have been motivated to combine the prior art to achieve the claimed invention, not something approximating it. *In re Dembiczak*, 175 F.3d 994, 999, 50 U.S.P.Q.2d 1624, 1616 (Fed. Cir. 1999) abrogated on other grounds by *In re Gartside*, 203 F.3d 1305, 53 U.S.P.Q.2d 1769 (Fed. Cir. 2000); *In re Royka*, 490 F.2d 981, 985, 180 U.S.P.Q. 580, 583 (CCPA 1974) (obviousness requires a suggestion of all, not some, elements in a claim). The United States Patent and Trademark Office (U.S.P.T.O.) has the initial burden to present its prima facie case of unpatentability. *In re Oetiker*, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). The core factual underpinnings of a case of unpatentability cannot be conclusions based on anything but concrete evidence in the record. *In re Zurko*, 59 USPQ2d 1693 (Fed. Cir. 2001). Indeed, a factual finding that is material to patentability can neither stand if it is supported only by conclusory statements nor be resolved on the subjective belief of an examiner. *In re Lee*, 277 F.3d 1338, 1346, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002).

In the present case, the Examiner has not met his initial burden of establishing a prima facie case of obviousness, because the Examiner did not provide factual evidence of why Seki taken with Oikawa in view of Liang teach or suggest a heat treated carbon having an atomic surface oxygen/ surface carbon ratio of 0.05 or less, an element that each of the claims 23-28 recites. On this basis alone, the Examiner failed to establish a prima facie case of obviousness.

In the Office Action of October 24, 2006 (October 24<sup>th</sup> Office Action), the Examiner formulated his rejection with respect to the argued element as follows:

(i) “Seki teaches in col. 2-3 especially removing NO<sub>x</sub> with ammonia over several packed beds of halogen-treated carbon”, see October 24<sup>th</sup> Office Action, page 2, lines 4-5.

(ii) “Seki does not explicitly teach the oxygen level of the carbon”, see October 24<sup>th</sup> Office Action, page 2, lines 7-8.

(iii) “Liang provides evidence that bromine treatment reduces the oxygen content – see col. 2”, see October 24<sup>th</sup> Office Action, page 2, lines 9-10.

(iv) “Arriving at the claimed oxygen level, if not inherently possessed, is an obvious expedient to optimize the bed activity”, see October 24<sup>th</sup> Office Action. Page 2, lines 9-11.

Appellants do not here dispute items (i)-(iii) in the Examiner’s formulation. Appellants, however, disagree with the Examiner on item (iv) as this assertion is a conclusory statement based on the Examiner’s subjective beliefs. Liang says nothing about what atomic surface oxygen to surface carbon ratios can be achieved via his bromine treatment. Appellants requested the Examiner to provide a concrete documentary evidence in support his assertion on page 6, two bottom lines, of the response filed January 23, 2007. As no such evidence was provided on the record, Appellants submit that the most one can arrive at by combining Seki and Liang is only something approximating the claimed invention and not the claimed invention. Thus, no prima facie case of obviousness is established by the Examiner, and therefore, the rejection should be reversed in its entirety.

For the record, Appellants submit that the Examiner did not rely on Oikawa in formulating the rejection with respect to a heat treated carbon having an atomic surface oxygen/ surface carbon ratio of 0.05 or less. Appellants further submit that Oikawa does not remedy deficiencies of Seki and Liang with respect to an atomic surface oxygen/ surface carbon ratio in a heat treated carbon.

2. Claims 25-26 Are Not Obvious Because The Cited Prior Art Fails To Teach Or Suggest The Particular Claimed 6-Valve Arrangement Of This Embodiment.

Claims 25-26 are patentable over Seki taken with Oikawa in view of Liang because Seki, Oikawa and Liang, taken alone or in combination, do not teach or suggest a particular arrangement of six valves (first through sixth valves) with respect the first reactor and the second reactor as reflected in elements (i)-(iii) of claims 25-26. As such, the Examiner failed to establish a prima facie case of obviousness.

With respect to the valve arrangement in question, the Examiner formulated his rejection in the October 24<sup>th</sup> Office Action as follows:

(i) “Seki ... shows numerous valves”, see October 24<sup>th</sup> Office Action, page 2, lines 6-7.

(ii) “In so far as Seki does not discuss the valve structure”, see October 24<sup>th</sup> Office Action, line 3,

(iii) “the claimed arrangement is an obvious expedient to permit servicing one portion without exposing the whole apparatus to air, and also to permit multiple system use wherein the flow is diverted to a second system while the first is regenerated/repaired or depressurized”, see October 24<sup>th</sup> Office Action, lines 13-16.

(iv) “Essentially, the valve system of claims 25 and 27 [sic: 26] is an obvious expedient to permit flexibility in how the system is used”, see October 24<sup>th</sup> Office Action, page 2, lines 16-17.

Appellants do not here dispute statement (i). Furthermore, Appellants agree with statement (ii), which Appellants interpret as the Examiner's admission that Seki does not teach the particular valve arrangement recited in claims 25 and 26. Appellants, however, disagree with statements (iii) and (iv), both of which are conclusory and based on the Examiner's subjective beliefs. Appellants requested the Examiner to provide concrete documentary evidence in support of statements (iii) and (iv) on page 7, line 11-12, of the January 23<sup>rd</sup> response. As no such concrete evidence was provided on the record, the rejection should be reversed.

For the record, Appellants submit that the Examiner did not rely on either Oikawa or Liang in formulating the rejection with respect to the particular valve arrangement in claims 25-26. Appellants further submit that neither Oikawa nor Liang can remedy deficiencies of Seki with respect to the particular valve arrangement in claims 25-26.

3. Claims 27 And 28 Are Not Obvious Because The Cited Prior Art Fails To Teach Or Suggest The Particular 6-Valve Arrangement Of This Embodiment.

Claims 27 and 28 are patentable over Seki taken with Oikawa in view of Liang because Seki, Oikawa and Liang, taken alone or in combination, do not teach or suggest a particular arrangement of six valves (first through sixth valves) with respect to the denitrator and the first and the second NH<sub>3</sub> adsorbers as reflected in elements (i)-(viii) of claims 27 and 28.

The Examiner used the same statements (i)-(iv), see section VII.A.2 above, in formulating his rejection with respect to the valve arrangement in claims 27 and 28.

As with claims 25 and 26, Appellants do not here dispute statement (i) and agree with statement (ii), which Appellants interpret as the Examiner's admission that Seki does not teach the particular valve arrangement recited in claims 27 and 28. Appellants, however, disagree with statements (iii) and (iv), both of which are conclusory and based on the Examiner's subjective beliefs. Appellants requested the Examiner to provide concrete documentary evidence in support of statements (iii) and (iv) on page 7, line 11-12, of the

January 23<sup>rd</sup> response. As no such concrete evidence was provided on the record, the rejection should be reversed.

For the record, Appellants submit that the Examiner did not rely on either Oikawa or Liang in formulating the rejection with respect to the particular valve arrangement in claims 27-28. Appellants further submit that neither Oikawa, nor Liang can remedy deficiencies of Seki with respect to the particular valve arrangement in claims 27-28.

4. Claims 24, 26 and 28 Are Not Obvious Because The Cited Prior Art Fails To Teach Or Suggest A Heat Treated Carbon Fiber As Claimed.

Claims 24, 26 and 28 are patentable over Seki taken with Oikawa in view of Liang because Seki, Oikawa and Liang, taken alone or in combination, do not teach a heat treated carbon fiber having an atomic surface oxygen/ surface carbon ratio of 0.05 or less required by each of the claims 24, 26 and 28.

With respect to the fiber element of claims 24, 26 and 28, the Examiner formulated his rejection as follows:

(i) “Seki teaches in col. 2-3 especially removing NO<sub>x</sub> with ammonia over several packed beds of halogen-treated carbon”, see October 24<sup>th</sup> Office Action, page 2, lines 4-5.

(ii) “Seki does not explicitly teach ... the fiber form”, see October 24<sup>th</sup> Office Action, page 2, lines 7-8.

(iii) “Oikawa teaches in col. 1 active carbon fiber as a sorbent”, see October 24<sup>th</sup> Office Action, page 2, line 11.

(iv) “Using this form of carbon is an obvious expedient to provide an active carbon desired by Seki”, see October 24<sup>th</sup> Office Action, page 2, lines 11-12.

Appellants do not here dispute statements (i)-(iii). Appellants, however, disagree with statement (iv), which is conclusory and is based on the Examiner’s subjective beliefs. Appellants pointed out to the Examiner an absence of concrete documentary evidence supporting statement (iv) on page 7, lines 20-21, of the January 23<sup>rd</sup> response. As the



Examiner failed to provide such an evidence on the record, Appellants submit that the Examiner failed to establish a prima facie case of obviousness and there Appellants request reversal of the rejection in whole.

**B. Claims 23-28 Are Not Obvious Under 35 U.S.C. § 103(a) Over Nishino (US patent no. 4,256,728) Taken With Oikawa (US patent no. 4,831,011) In View Of Liang (US patent no. 5,462,908).**

1. Claims 23-28 Are Not Obvious Because The Prior Art Fails to Teach or Suggest heat Treated Carbon Having An Atomic Surface Oxygen/Surface Carbon Ratio Of 0.05 Or Less.

Claims 23-28 are patentable over Nishino taken with Oikawa in view of Liang because Nishino, Oikawa and Liang, taken alone or in combination, fail to teach or suggest several elements disclosed in each of the claims 23-28, including a heat treated carbon having an atomic surface oxygen/ surface carbon ratio of 0.05 or less.

In the October 24<sup>th</sup> Office Action, the Examiner formulated his rejection with respect to the element in question as follows:

(i) “Nishino teaches plural beds which can be active carbon”, see October 24<sup>th</sup> Office Action, page 2, line 23;

(ii) “Nishino does not teach carbon which has the claimed oxygen level”, see October Office Action, page 2, lines 23-24;

(iii) “Liang provides evidence that bromine treatment reduces the surface oxygen content- see col. 2”, see October 24<sup>th</sup> Office Action, page 2, lines 24-25;

(iv) “Arriving at the claimed oxygen level, if not inherently possessed, is an obvious expedient to optimize the bed activity”, see October 24<sup>th</sup> Office Action, page 2, lines 25-26.

Appellants do not here dispute statements (ii)-(iii) of the Examiner. Appellants find it necessary to provide a clarification of the Examiner’s statement (i) as in fact Nishino teaches only a single bed with active carbon in the presence of bromine or chlorine, to which Liang’s

teaching of reducing surface oxygen content upon bromine treatment (statement iii) can be applied. Still, Appellants' argument is essentially focused on a disagreement with the Examiner's statement (iv).

As the Examiner uses a minimalistic approach in presenting his rejection, Appellants provide their interpretation of the cited references with respect to statement (i). What Nishino actually teaches is "a deodorizing method characterized by allowing a gas containing as main bad-smelling components (a) hydrogen sulfide and/or a mercaptan, (b) a sulfide and/or a disulfide and (c) ammonia and/or an amine to contact (1) firstly with activated carbon, (2) then with activated carbon or clay mineral having an acid supported thereon and (3) subsequently with activated carbon in the presence of bromine or chlorine," see Nishino col. 1, lines 33-41. Thus, statement (i) of the Examiner should be restated to say that Nishino teaches a bed with activated carbon, a bed with activated carbon or clay material having an acid supported thereon and a bed with activated carbon in the presence of bromine or chlorine. Appellants believe this is the only reasonable interpretation, as Nishino teaches only a single bed or reactor with activated carbon in the presence of bromine or chlorine, to which Liang's teaching of reducing surface oxygen content upon bromine treatment (statement iii) can be applied. The Examiner admitted this deficiency of Nishino by stating "Nishino differs in not having plural beds of the same type" on page 3, line 1, of the October 24<sup>th</sup> Office Action. Although the Examiner tries to remedy this deficiency of Nishino by asserting that "using more than one bed is an obvious expedient for complete capture of the pollutant of interest", see October 24<sup>th</sup> Office Action, page 3, lines 1-2, such an assertion is a conclusory statement based on the Examiner's beliefs and not supported by concrete evidence in the record.

Regardless of whether Nishino teaches or suggests a single bed or plural beds with active carbon in the presence of bromine or chlorine, Appellants disagree with the Examiner's statement (iv) as Liang says nothing about what atomic surface oxygen to surface carbon ratios can be achieved via his bromine treatment. Therefore, statement (iv) is conclusory and based on the Examiner's subjective beliefs. Appellants requested the Examiner to provide concrete documentary evidence in support of statement (iv) on page 8, lines 5-7, of the January 23<sup>rd</sup> response. Appellants submit that the most one can arrive at by combining

Nishino and Liang is only something approximating the claimed invention and not the claimed invention. Thus, no prima facie case of obviousness is established by the Examiner, and therefore the rejection should be reversed in its entirety.

For the record, Appellants submit that the Examiner did not rely on Oikawa in formulating the rejection with respect to a heat treated carbon having an atomic surface oxygen/ surface carbon ratio of 0.05 or less. Appellants further submit that Oikawa does not remedy deficiencies of Seki and Liang with respect to an atomic surface oxygen/ surface carbon ratio in a heat treated carbon.

2. Claims 25 And 26 Are Not Obvious Because The Cited Prior Art Fails To Teach or Suggest The Particular Claimed 6-Valve Arrangement Of This Embodiment.

Claims 25 and 26 are patentable over Nishino taken with Oikawa in view of Liang because Nishino, Oikawa and Liang, taken alone or in combination, do not teach or suggest a particular arrangement of six valves (first through sixth valves) with respect the first reactor and the second reactor as reflected in elements (i)-(iii) of claims 25 and 26. As such, the Examiner failed to establish a prima facie case of obviousness.

In the October 24<sup>th</sup> Office Action, the Examiner provided the following commentary with respect to the valve arrangement recited in claims 25 and 26:

(i) “Nishino does not discuss the valve structure”, see October 24<sup>th</sup> Office Action, page 3, lines 5-6.

(ii) “However, the claimed arrangement is an obvious expedient to permit servicing one portion without exposing the whole apparatus to air, and also to permit multiple system use wherein the flow is diverted to a second system while the first is regenerated/repairs or depressurized”, October 24<sup>th</sup> Office Action, page 3, lines 6-9.

(iii) “Essentially, the valve system of claims 25 and 27 is an obvious expedient to permit flexibility in how the system is used”, see October 24<sup>th</sup> Office Action, page 3, lines 9-10.

Appellants agree with the Examiner on statement (i). Appellants respectfully disagree with the Examiner's statements (ii) and (iii), which are identical to the statements (iii) and (iv) used by the Examiner in presenting his case in the rejection over Seki taken with Liang in view of Oikawa, see section VII.A.2.

The present statements (ii) and (iii) are conclusory and are based on the Examiner's subjective beliefs. Appellants requested the Examiner to provide concrete documentary evidence in support of the present statements (ii) and (iii) on page 8, lines 18-19, of the January 23<sup>rd</sup> response. As no such documentary evidence was provided on the record, no prima facie case of obviousness is established by the Examiner, and therefore, the rejection should be reversed.

For the record, Appellants respectfully submit that the Examiner did not rely on either Oikawa, or Liang in presenting his case with respect to the particular valve arrangement of claims 25-26. Furthermore, Appellants respectfully submit that Oikawa and Liang, taken alone or in combination remedy deficiencies of Nishino with respect to the particular valve arrangement of claims 25-26.

3. Claims 27 and 28 Are Not Obvious Because The Cited Prior Art Fails To Teach Or Suggest The Particular Claimed 6-Valve Arrangement Of This Embodiment.

Claims 27 and 28 are patentable over Nishino taken with Oikawa in view of Liang because Nishino, Oikawa and Liang, taken alone or in combination, do not teach or suggest a particular arrangement of six valves (first through sixth valves) with respect to the denitrator and the first and the second NH<sub>3</sub> adsorbers as reflected in elements (i)-(viii) of claims 27 and 28. As such, the Examiner failed to present a prima facie case of obviousness.

In the presenting his case in the October 24<sup>th</sup> Office Action, the Examiner does not distinguish the valve structure of claims 27 and 28 from the valve structure of claims 25 and 26 using statements (i)-(iii), see section VII.B.2.

As for claims 25 and 26, Appellants do not here dispute statement (i). Appellants, however, disagree with statements (ii) and (iii), which are conclusory and are based on the

Examiner's subjective beliefs. Appellants requested the Examiner to provide concrete documentary evidence in support of statements (ii) and (iii) on page 8, lines 18-19, of the January 23<sup>rd</sup> response. As no such documentary evidence was provided on the record, no prima facie case of obviousness is established by the Examiner, and therefore, the rejection should be reversed.

For the record, Appellants respectfully submit that the Examiner did not rely on either Oikawa, or Liang in presenting his case with respect to the particular valve arrangement of claims 27 and 28. Furthermore, Appellants respectfully submit that Oikawa and Liang, taken alone or in combination, fail to remedy deficiencies of Nishino with respect to the particular valve arrangement of claims 27 and 28.

4. Claims 24, 26 and 28 Are Not Obvious Because The Cited Prior Art Fails To Teach Or Suggest Heat Treated Carbon Fiber As Claimed.

Claims 24, 26 and 28 are patentable over Nishino taken with Oikawa in view of Liang because Nishino, Oikawa and Liang, taken alone or in combination, do not teach a heat treated carbon fiber having an atomic surface oxygen/ surface carbon ratio of 0.05 or less required by each of the claims 24, 26 and 28.

With respect to the "fiber" element, the Examiner presented his case in the October 24<sup>th</sup> Office Action as follows:

(i) "Nishino teaches plural beds which can be active carbon", see October 24<sup>th</sup> Office Action, page 2, line 23;

(ii) "Nishino does not teach ... the fiber form", see October 24<sup>th</sup> Office Action, page 2, lines 23-24;

(iii) "Oikawa teaches in col. 1 carbon fiber", see October 24<sup>th</sup> Office Action, page 3, line 14;

(iv) "Using this form is an obvious expedient to provide the active carbon desired by Nishino", see October 24<sup>th</sup> Office Action, page 3, lines 14-15.

Appellants provided their interpretation of statement (i) in section VII.B.I above. Appellants do not here dispute statements (ii)-(iii). Appellants, however, disagree with statement (iv), which is conclusory and is based on the Examiner's subjective beliefs. Appellants pointed out to the Examiner an absence of a concrete documentary evidence supporting statement (iv) on page 8, lines 26-27, of the January 23<sup>rd</sup> response. As the Examiner failed to provide such any evidence in the record, Appellants submit that the Examiner failed to establish a prima facie case of obviousness, and therefore, Appellants request reversal of the rejection in its entirety.

**CONCLUSION**

For the reasons discussed above, Appellants respectfully submit that all the pending claims are in condition for allowance, and respectfully request that the rejections be reversed in whole, and that the claims be allowed to issue.

Respectfully submitted,

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**VIII. APPENDIX A: CLAIMS APPENDIX**

23. A denitration system comprising

(A) a first reactor that has an inlet and an outlet and that is packed with a heat treated active carbon having an atomic surface oxygen/ surface carbon ratio of 0.05 or less;

(B) a second reactor that has an inlet and an outlet and that is packed with said heat treated active carbon, wherein the outlet of the first reactor is connected to the inlet of the second reactor;

(C) an ammonia supply line that is connected the inlet of said first reactor;

(D) a system inlet that is connected to the inlet of said first reactor; and

(E) a system outlet that is connected to the outlet of the second reactor.

24. The denitration system of claim 23, wherein the heat treated active carbon is a heat treated carbon fiber.

25. A denitration system comprising

(A) a first reactor that has an inlet and an outlet and that is packed with a heat treated active carbon having an atomic surface oxygen/ surface carbon ratio of 0.05 or less;

(B) a second reactor that has an inlet and an outlet and that is packed with said heat treated active carbon;

(C) an ammonia supply line that is connected to the inlet of the first reactor through a first valve and to the inlet of the second reactor through a second valve;

(D) a system inlet that is connected to the inlet of the first reactor through the first valve and to the inlet of the second reactor through the second valve; and

(E) an outlet of the denitration system,

wherein

(i) the outlet of the first reactor is connected to the inlet of the second reactor through the third valve and to the system outlet through the fourth valve,

(ii) the outlet of the second reactor is connected to the system outlet through the fifth valve and the inlet of the first reactor through the sixth valve, and

(iii) if the first, third and fifth valves are open, the second, fourth and sixth valves are



closed, and if the first, third and fifth valves are closed, the second, fourth and sixth valves are open.

26. The denitration system of claim 25, wherein the heat treated active carbon is a heat treated carbon fiber.

27. A denitration system comprising

(A) a denitrator that has an inlet and an outlet and that is packed with a heat treated active carbon having an atomic surface oxygen/ surface carbon ratio of 0.05 or less;

(B) a first  $\text{NH}_3$  adsorber that has an inlet and an outlet;

(C) a second  $\text{NH}_3$  adsorber that has an inlet and an outlet;

(D) a first ammonia supply line;

(E) a second ammonia supply line;

(F) a system inlet; and

(G) a system outlet,

wherein

(i) the system inlet is connected to the inlet of the first adsorber via a first valve and to the outlet of the second adsorber through the second valve;

(ii) the first ammonia supply line is connected to both the inlet of the denitrator and the outlet of the first adsorber through a third valve;

(iii) the second ammonia supply line is connected to both the outlet of the denitrator and the inlet of the second adsorber through a fourth valve;

(iv) the inlet of the denitrator is connected to the outlet of the first adsorber;

(v) the outlet of the denitrator is connected to the inlet of the second adsorber;

(vi) the outlet of the second adsorber is connected to the system outlet through a fifth valve;

(vii) the inlet of the first adsorber is connect to the system outlet through a sixth valve; and

(viii) if the first, third and fifth valves are open, the second, fourth and sixth valves are closed, and if the first, third and fifth valves are closed, the second, fourth and sixth valves are open.

28. The denitration system of claim 27, wherein the heat-treated active carbon is a heat treated carbon fiber.

**IX. APPENDIX B: EVIDENCE APPENDIX**

U.S. Patent No. 3,961,020 to Seki applied in the Office Action of October 24, 2006, page 2;

U.S. Patent No. 4,831,011 to Oikawa applied in the Office Action of October 24, 2006, page 2;

U.S. Patent No. 5,462,908 to Liang applied in the Office Action of October 24, 2006, page 2;

U.S. Patent No. 4,256,728 to Nishino applied in the Office Action of October 24, 2006, page 2.

**X. APPENDIX C. RELATED PROCEEDINGS APPENDIX**

No related proceedings are pending.